

REMARKS

Status of the Claims

Claims 1-6 are pending in the application, with Claims 1 and 4 being independent. Claims 1 and 4 have been amended. Support for the claim changes can be found in the original disclosure, for example in Figures 1-6 and the accompanying description, and therefore no new matter has been added.

Requested Action

Applicant respectfully requests the Examiner to reconsider and withdraw the outstanding rejections in view of the foregoing amendments and the following remarks.

Substantive Claim Rejections

Claims 1, 2, 4 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,812,191 (Orava et al.) in view of U.S. Patent No. 7,098,950 (Yamamoto et al.), and further in view of U.S. Patent No. 6,567,125 (Shimizu). Claims 3 and 6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Orava et al. in view of Yamamoto et al., and U.S. Patent No. 6,163,024 (Kozuka et al.).

In response, while not conceding the propriety of the rejections, independent Claims 1 and 4 have been amended. Applicant submits that as amended, independent Claims 1 and 4 are allowable for the following reasons.

Independent Claim 1 relates to an image pickup apparatus in which a pixel area, including a plurality of pixels each having a photoelectric conversion portion and a common output portion configured to sequentially amplify and output signals from the

plurality of pixels included in the pixel area, is formed on a single semiconductor substrate. The apparatus comprises a power supply unit and a control circuit. The power supply unit is configured to effect power supply control of the common output portion independently of control of the power supply to the pixel area.

Claim 1 has been amended to recite a determination unit configured to determine a photo-charge accumulation period of the photoelectric conversion portion in accordance with an exposure detected by photometry processing and a photographing mode.

Claim 1 has also been amended to recite that the control circuit is configured to control the power supply unit in accordance with the photo-charge accumulation period of the photoelectric conversion portion detected by the determination unit, so as to, if the photo-charge accumulation period of the photoelectric conversion portion is longer than a predetermined accumulation time, supply no power to the common output portion in a predetermined period after starting photo-charge accumulation in the photoelectric conversion portion and supply power to the common output portion before the end of the photo-charge accumulation period in the photoelectric conversion portion, and to, if the photo-charge accumulation period of the photoelectric conversion portion is shorter than a predetermined accumulation time, continue to supply the power to the common output portion throughout the photo-charge accumulation period without switching the power supply thereto.

Claim 4 has been amended to recite the same determination unit as amended Claim 1. In addition, Claim 4 has been amended to recite that its control circuit is configured to control the power supply unit in accordance with the photo-charge accumulation period of the photoelectric conversion portion detected by the determination unit, so as to, if the

photo-charge accumulation period of the photoelectric conversion portion is longer than a predetermined accumulation time, supply power of a second power level to the common output portion in a predetermined period after starting photo-charge accumulation in the photoelectric conversion portion and supply the first power level to the common output portion before the end of the photo-charge accumulation period in the photoelectric conversion portion, and to, if the photo-charge accumulation time of the photoelectric conversion portion is shorter than a predetermined accumulation time, continue to supply a first power level to the common output portion throughout the photo-charge accumulation period without switching the power supply thereto.

By these arrangements, a photo-charge-accumulation-period-dependent power supply to a common output portion is effected. As a result, the switching of the power supply to the common output portion depends on the detected photo-charge-accumulation-period.

In contrast, the citations to Orava et al., Yamamoto et al., and Shimizu are not understood to relate to a photo-charge-accumulation-period-dependent power supply in which the switching of the power supply to the common output portion depends on the detected photo-charge-accumulation-period.

Accordingly, these citations are not understood to disclose or suggest that a control circuit is configured to control the power supply unit in accordance with the photo-charge accumulation period of the photoelectric conversion portion detected by a determination unit that is configured to determine a photo-charge accumulation period of the photoelectric conversion portion in accordance with an exposure detected by photometry processing and a photographing mode, so as to, if the photo-charge accumulation period of

the photoelectric conversion portion is longer than a predetermined accumulation time, supply no power to the common output portion in a predetermined period after starting photo-charge accumulation in the photoelectric conversion portion and supply power to the common output portion before the end of the photo-charge accumulation period in the photoelectric conversion portion, and to, if the photo-charge accumulation period of the photoelectric conversion portion is shorter than a predetermined accumulation time, continue to supply the power to the common output portion throughout the photo-charge accumulation period without switching the power supply thereto, as recited by amended Claim 1.

And these citations are not understood to disclose or suggest that a control circuit is configured to control the power supply unit in accordance with the photo-charge accumulation period of the photoelectric conversion portion detected by a determination unit that is configured to determine a photo-charge accumulation period of the photoelectric conversion portion in accordance with an exposure detected by photometry processing and a photographing mode, so as to, if the photo-charge accumulation period of the photoelectric conversion portion is longer than a predetermined accumulation time, supply power of the second power level to the common output portion in a predetermined period after starting photo-charge accumulation in the photoelectric conversion portion and supply the first power level to the common output portion before the end of the photo-charge accumulation period in the photoelectric conversion portion, and to, if the photo-charge accumulation time of the photoelectric conversion portion is shorter than a predetermined accumulation time, continue to supply the first power level to the common

output portion throughout the photo-charge accumulation period without switching the power supply thereto, as recited by amended Claim 4.

The Office Action cites column 6, lines 5-32 of the Shimizu patent to show a control circuit configured to effect control in accordance with a photo-charge accumulation period. However, this portion of the Shimizu patent is understood to merely disclose that upon receiving an exposure starting signal, a CPU 12 outputs a power control signal to an output amplifier power source circuit 68 to reduce electric power to be supplied from the output amplifier power source circuit 68 to an output amplifier 62, and that upon receiving an exposure completion signal, the CPU 12 outputs the power control signal to the output amplifier power source circuit 68 to supply, from the output amplifier power source circuit 68 to the output amplifier 62, the electric power required to transfer analog image data corresponding to electric charges accumulated by a CCD 6. Thus, Applicant finds no support in this passage for a photo-charge-accumulation-period-dependent power supply in which the switching of the power supply to the common output portion depends on the detected photo-charge-accumulation-period, as can be confirmed by reviewing this passage, which is reproduced below:

According to the above described embodiment, when the camera control circuit 12 receives an exposure start signal, it outputs a power control signal to the output amplifier power source circuit 68 to lower power fed from the output amplifier power source circuit 68 to the output amplifier 62. Therefore, even when the CCD is exposed to light for a long time for detecting very weak light such as chemiluminescence emission or fluorescent light, it is possible to prevent noise caused by heat emitted from the CCD 6 from being generated in the image. Further, when the camera control circuit 12 receives an exposure completion signal, it outputs a power control signal to the output amplifier power source circuit 68 to cause it to feed power capable of transferring analog image data accumulated in the

CCD 6 in the form of charges to the output amplifier 62. Therefore, even when a CCD having an extremely great number of pixels is used for obtaining an image of high quality, image data can be read out at high speed. Moreover, when the output signal from the output amplifier 62 stabilizes after power fed from the output amplifier power source circuit 68 to the output amplifier 62 has been increased up to the level enabling the output amplifier 62 to transfer analog image data accumulated in the form of charges, the correcting means 70 produces a correction signal for correcting the offset of the output amplifier 62 and corrects the offset of the output amplifier 62 within a predetermined time period and analog image data accumulated in the CCD 6 in the form of charges are then transferred. Therefore, it is possible to obtain a stable image signal. (col. 6, lines 5-32)

Since amended Claims 1 and 4 recite at least one feature not disclosed or suggested by the citations to Orava et al., Yamamoto et al., and Shimizu, Applicant submits that the Office has not yet established a prima facie case of obviousness against amended Claims 1 and 4. Therefore, Applicant respectfully requests that the rejection of amended Claims 1 and 4 be withdrawn.

The dependent claims are also submitted to be patentable, due to their dependency from the independent base claims, as well as due to additional features that are recited. Individual consideration of the dependent claims is respectfully solicited.

Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration, withdrawal of the outstanding rejections, and passage to issue of the present application.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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